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Software Quality Challenge

DEPENDS ON

Unique Characteristic of the Software

Environments for which SQA methods are developed

Software Quality Challenge

Unique Characteristic of the Software

The unique characteristics of software

as a product

and

as production process

Unique Characteristic of the Software

Unique Characteristic of the Software

Characteristic	Software products	Other industrial products
Complexity	Usually, very complex product allowing for very large number of operational options	Degree of complexity much lower, allowing at most a few thousand operational options
Visibility of product	Invisible product, impossible to detect defects or omissions by sight (e.g. of a diskette or CD storing the software)	Visible product, allowing effective detection of defects by sight
Nature of Product development and production process	Opportunities to detect defects arise in only one phase namely product development phase	Opportunities to detect defects arise in all phases of development and production: Product development, Product production planning, Manufacturing

Environments for which SQA methods are developed

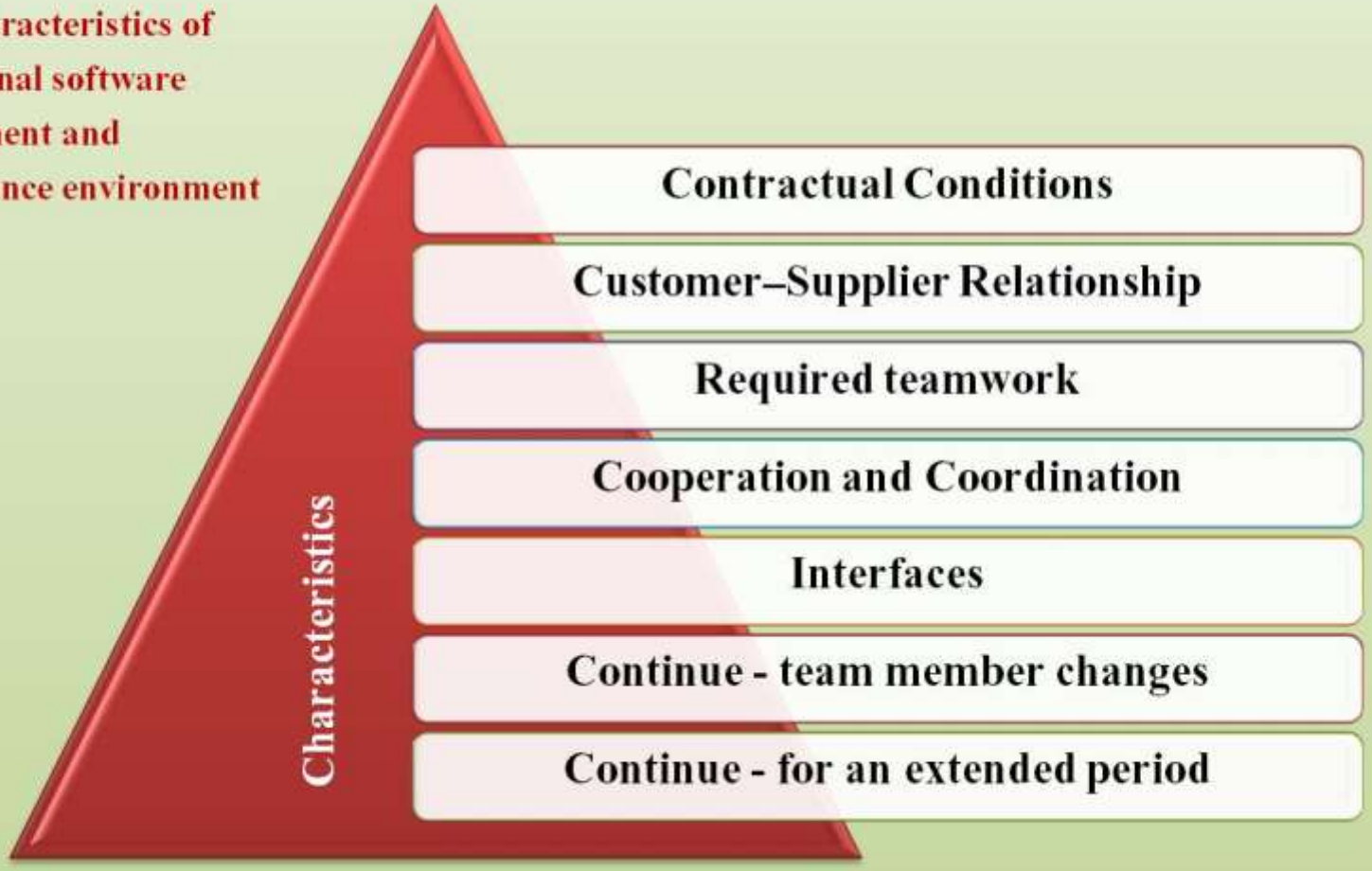
Environments

- **Pupils and Students** - part of their education
- **Software Amateurs** - hobby
- **Professionals in engineering, economics, management and other fields** - assist them in their work
- **Software development professionals** - professional career objective

Environments for which SQA methods are developed

Environments

Main characteristics of professional software development and maintenance environment



Environments for which SQA methods are developed

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Main characteristics of professional software development and maintenance environment

Contractual Conditions

1. Contractual conditions

The activities of software development and maintenance need to cope with:

- The functional requirements of the developed software
- The project budget.
- The project timetable.

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Customer–Supplier Relationship

2. Subjection to customer–supplier relationship

- Throughout the process of software development and maintenance, activities are under the oversight of the customer.
- The project team has to cooperate continuously with the customer: to consider his request for changes, to discuss his criticisms about the various aspects of the project, and to get his approval for changes initiated by the development team.

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Required teamwork

3. Required Teamwork

- Three factors usually motivate the establishment of a project team
  - Timetable requirements. In other words, the workload undertaken during the project period requires the participation of more than one person if the project is to be completed on time.
  - The need for a variety of specializations in order to carry out the project.
  - The wish to benefit from professional mutual support and review for the enhancement of project quality.

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Cooperation and Coordination

4. Cooperation and coordination with other software teams

- Cooperation is required with
  - Other software development teams in the same organization.
  - Hardware development teams in the same organization.
  - Software and hardware development teams of other suppliers.
  - Customer software and hardware development teams that take part in the project's development.

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Interfaces with other software systems

5. Interfaces with other software systems

- Main types of interfaces:
  - Input interfaces, where other software systems transmit data to your software system.
  - Output interfaces, where your software system transmits processed data to other software systems.
  - Input and output interfaces to the machine's control board, as in medical and laboratory control systems, metal processing equipment, etc.

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Continue - team member changes

6. The need to continue carrying out a project despite team member changes

- It is quite common for team members to leave the team during the project development period, whether owing to promotions to higher level jobs, a switch in employers, transfers to another city, and so forth.
- The team leader then has to replace the departing team member either by another employee or by a newly recruited employee.
- No matter how much effort is invested in training the new team member, "the show must go on", which means that the original project contract timetable will not change.

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Continue - for an extended period

7. The need to continue carrying out software maintenance for an extended period

- Customers who develop or purchase a software system expect to continue utilizing it for a long period, usually for 5–10 years.
- During this period, the need for maintenance will eventually arise. In most cases, the developer is required to supply these services directly.

Summary

Two major challenges of software quality?

Environments for which SQA methods are developed?

Main characteristics of professional software development and maintenance environment?